

**Conservation Leadership Programme: Final Report**

CLP Project ID: 03495821

**Conservation of Black Softshell Turtle through participatory approach in Assam, Northeast India**



**Host country:** India

**Location:** Biswanath, Kamrup, Lakhimpur and Sonitpur District of Assam

**September 2021- August 2022**

**Habitat assessment, participatory conservation and husbandry improvement of critically endangered Black Softshell Turtle**

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**Field Assistants:** We would like to express our heartfelt gratitude to Mr. Krishna Das, TSA field assistant and Mr. Pranab Malakar, Caretaker of Hayagriva Madhab Temple pond.

## Section 1:

### Summary (max 200 words)

The project was initiated with a survey to understand perception of local community towards turtle conservation in the two target temples - Nagshankar and Hayagriva Madhab. Key stakeholders were identified through meetings to inform project need and objectives. Signages were installed at strategic locations and four nesting areas were enhanced at the temples. Water quality in temple ponds was routinely assessed to inform general health and wellbeing of turtles. Various target groups were informed status and plight of Black Softshell Turtle (BST) through conservation messaging. Capacity building trainings were done for 33 students, 20 teachers and 19 forest staffs using KURMA application. A total of 365 freshwater turtles representing eight species were directly sighted during an intensive survey of Brahmaputra covering 277km along the districts of Sonitpur, Biswanath and Lakhimpur. A baseline on the presence and habitat suitability of target species, through direct and indirect evidences in the wild was obtained. Nest search efforts around Nagsankar Temple during April and May 2022 yielded total 123 eggs and hatching success of close to 40% through monitoring. BST nursery cum rearing facility was developed at Nature Discovery Centre for long term rearing of the hatchlings before their eventual release to the wild.

### Introduction (max 500 words)




Black Softshell Turtle (*Nilssonina nigricans*) is a Critically Endangered (Praschag et al., 2021) species of freshwater softshell turtle with historical distribution across the north-east India especially in the Brahmaputra River and its tributaries in the State of Assam. The species is recorded earlier from the Nameri National Park and Kaziranga National Park (Praschag & Gemel, 2002). Smaller, isolated and confined populations also exist in different temple ponds across Assam and Tripura. In its geographic range, the species is also recorded from the Meghna and Karnaphuli River, and in the sacred ponds in Chittagong district in Bangladesh.

The Red List Workshop at Lucknow in 2005 estimated that the population of the species in the wild may have declined around 20% per generation. Furthermore, subsistent poaching of wild eggs is a major threat in the Brahmaputra floodplain (Baruah et al., 2010). The temple turtle populations are confined to overcrowded ponds, surviving mostly on provisional food materials as primary source, and are vulnerable to possible health risk from disease, inbreeding depression, and death due to different co-occurring stressors (disease, nutritional deficiency, in-fighting ) (Baruah et al., 2010).

The project aimed at identifying the potential habitats by gathering of anecdotal records and ground truthing of species presence along the key stretches of Brahmaputra. Moreover, the project intended to assist in better management of population present in temple ponds with the support of identified stakeholders and enhance community participatory conservation efforts, through education and awareness among temple visitors, local community members, and school students. Concerted actions such as habitat surveys, nest protection and monitoring, egg collection, water quality assessments, and basic health status assessment of temple turtles in consultation with experienced veterinarians were undertaken under various project objectives alongside development

of Black Softshell Turtle nursing cum rearing facility at Nature Discovery Centre in Biswanath for long term rearing of the hatchlings and eventual wild release for enhanced survival success.

### Project members

Name	Qualification	Role	Age
<p data-bbox="188 412 309 445">Daisy Das</p> 	<p data-bbox="667 412 863 472">MSc. in Wildlife Science</p>	<p data-bbox="890 412 1211 651">Team leader, field data collection, data compilation, data analysis, report writing, coordinating with the stakeholders, organising and planning events</p>	<p data-bbox="1238 412 1270 445">28</p>
<p data-bbox="188 770 480 804">Uditya Kumar Borkataki</p> 	<p data-bbox="667 770 863 831">MSc. in Wildlife Science</p>	<p data-bbox="890 770 1211 1010">GIS expert, field data collection, GIS mapping, coordinating with locals for awareness programs, designing IEC materials, organising and planning events</p>	<p data-bbox="1238 770 1270 804">27</p>
<p data-bbox="188 1173 352 1207">Sushmita Kar</p> 	<p data-bbox="667 1173 863 1234">MSc. in Wildlife Science</p>	<p data-bbox="890 1173 1211 1312">Communication expert, media outreach, drafted the conservation action plan, organising events</p>	<p data-bbox="1238 1173 1270 1207">27</p>

## Section 2:

### **Aim and objectives (max 200 words)**

The aim of the project was to gather habitat suitability data of the wild population of *Nilssonina nigricans* and generate species distribution map. We aimed at strengthening participatory conservation among various stakeholders and improving husbandry management in the temple ponds to safeguard the captive raised population of the Black Softshell Turtle.

### **Objectives**

- 1) Preparation of species distribution map for the probable habitats of the wild population of *Nilssonina nigricans*.
- 2) Increased awareness among the local communities and other stakeholders in addition to training 10 potential volunteers.
- 3) Preparation of scientifically backed recommendation plan for safeguarding the turtle population in temple ponds.

### **Changes to original project plan (max 200 words)**

Initially, we targeted nine educational awareness programs in the Biswanath, Lakhimpur and Sonitpur districts of Assam. However, the observations during the river survey indicated higher turtle diversity and need for conservation outreach in the Biswanath district compared to the other two. Therefore, all nine education awareness events were conducted in Biswanath to fulfil the objective.

Another strategically important temple Shri Shri Hayagriva Madhab Temple was also included as one of the intervention sites for spreading the conservation message on the species. The temple is located in Hajo area of Kamrup District and is 50km from the Assam state capital. The temple pond holds a significant population of the Black Softshell Turtle and recently received much needed conservation focus from the district administration and other stakeholders. The temple committee is also a party to the Memorandum of Understanding for Black Softshell Turtle Vision Plan 2030 with other partners as District Administration Kamrup, Turtle Survival Alliance and local NGO. This temple was thus a much-needed inclusion for the outlined activities in the project for the benefit of the species.

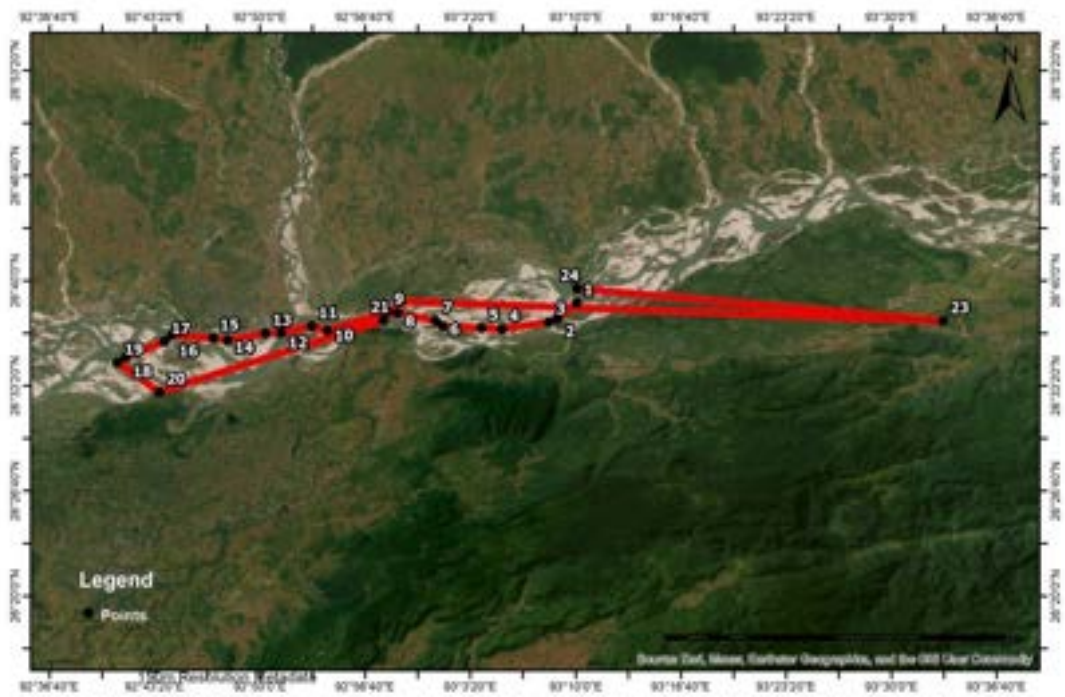
### **Methodology (max 500 words)**

A two-phased river survey was conducted in the 277 square kilometer stretch of Brahmaputra-Subansiri river systems covering the districts of Sonitpur, Biswanath, and Lakhimpur. A boat-based transect method was adopted for the present study. The study segment of the rivers was deconstructed into 5 km segments (Figure 1). Each of the segments was divided into two parts; 1 km of intensive survey zone and 4 km of opportunistic observation zone (Galan, 2015). A maximum of 25 km was covered per day (Singh et al., 2021; Basumatary & Sharma, 2013; Baruah et al., 2011). The information on the presence of the turtle species through direct and indirect pieces of evidence was collected and recorded in a GIS domain. Important habitat features such as bank and shoreline characters, water depth, and anthropogenic influences were also recorded (Sonkar et al., 2019; Beechie et al., 2005). Apart from boat-based surveys, opportunistic foot surveys were also conducted in the riverine chars to document direct and indirect evidence of turtle presence, their

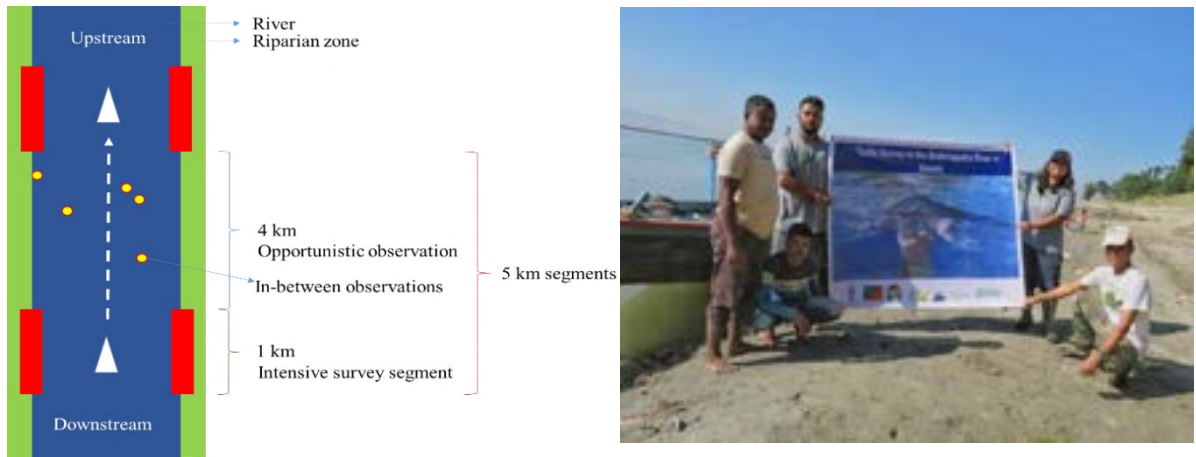
nects, and threats, if any. Visual encounter surveys were used to confirm the species and records were also obtained from the riverine chars (*sapori*). As a part of community engagement and to access traditional knowledge, the representatives from the riparian communities were interacted in questionnaire surveys and relevant information based on local anecdotes and the presence of species/population status was recorded (Stratmann et al. 2016; Vollmer et al. 2015).



**Figure 1:** Map of the surveyed area from Biswanath to Lakhimpur during 1<sup>st</sup> phase of river survey



**Figure 2:** Map of the surveyed area from Biswanath to Sonitpur during 2<sup>nd</sup> phase of river survey



**Figure 3:** Layout plan for the riverine survey

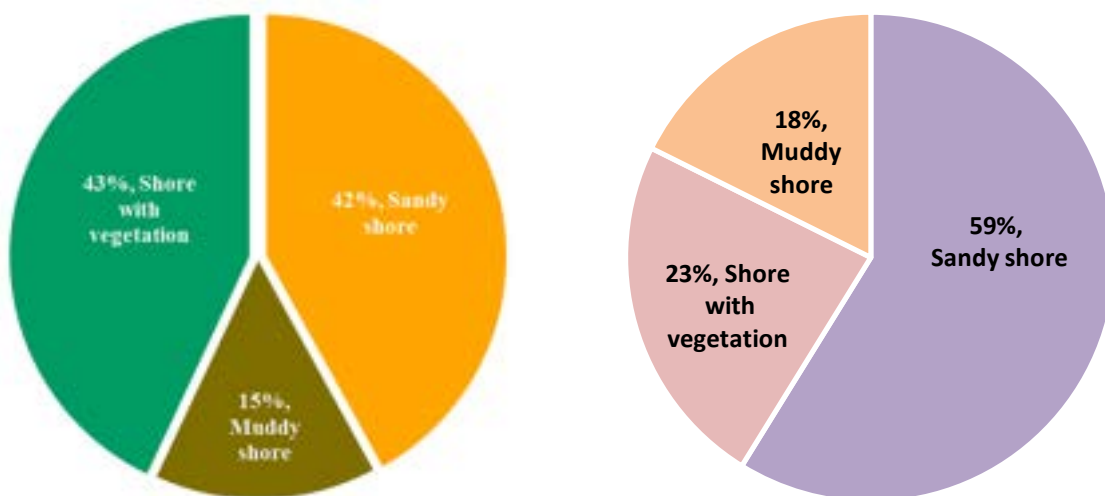


Prior to the awareness programs, close ended questionnaire surveys were done to assess the community's perception and attitude on turtle conservation. Leaflets and stickers were distributed. Education cum awareness and outreach programs were organised in several local academic institutions, temple premises and public places. Capacity building trainings were provided to selected volunteers on identification, reporting, handling and rescuing of a turtle using KURMA application. Various biological important days were celebrated in the districts of Biswanath and Kamrup of Assam to engage stakeholders in a participatory conservation of Black Softshell Turtle.

Current status of the freshwater turtles in the temple ponds were assessed in the districts of Biswanath, Sonitpur and Kamrup. Visual encounter surveys using binoculars were carried out in the four temple ponds. Turtle species were identified based on morphological features and identification leaflets. Other notable factors such as water quality of the temple pond, availability of basking and nesting area and feeding behaviour of the turtles were observed. Stakeholder meetings were arranged with the district administrations and temple committees to discuss the shortcomings of the Black Softshell turtle conservation in the temple ponds. The health assessment of the captive population of *Nilssonina* species in Shri Shri Hayagriva Madhab Temple and Nagsankar Temple was carried out. Individuals were captured using a sampling gear, tagged and morphometric measurements using vernier caliper were taken. Blood samples and skin scrapings were collected. General observations of the animal posture, injuries and external parasites were noted, if any. Day and night monitoring of nesting female turtles in Nagsankar Temple was carried out.

**Outputs and Results (max 500 words)**

Collectively in the two phases of the river survey, a total of 355 hardshell turtles and 10 softshell turtles were recorded through direct sighting. The study stretch of the river was dominated by a combination of sandy shoreline and shoreline with vegetation cover. The depth in the surveyed stretch of the Brahmaputra River had an average of 16 feet going upstream and an average of 24 feet going downstream.



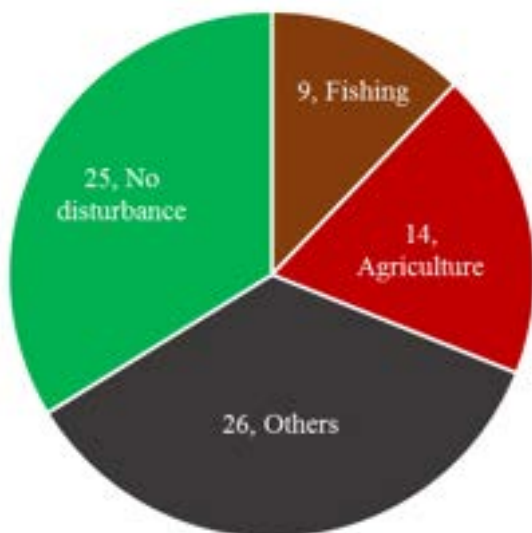
**Figure 4 and 5:** Observed habitat types during the first and second phase of river survey

While going upstream from Biswanath Ghat to Gogamukh, activities of the riverside communities such as daily washing, water usage, grazing were the major anthropogenic disturbances in the studied stretch followed by agriculture and fishing activities. 44% of the stretch had no disturbance including the stretch along the Kaziranga National Park. No such anthropogenic disturbances were observed in the second phase of the river survey.

Based on habitat variables, anthropogenic disturbances and potential habitats for future protection and rehabilitation activities for the species were identified. These 'priority habitats' can be considered for further protection and community based conservation measures in the north-bank landscape (Appendix I). Majority of the respondents in the questionnaire survey mentioned that they depend solely on fishing (45%). Most of the fishermen carry out fishing for an hour (35.5%), covering an area of 3 km (26%). Majority of the fishermen (58%) acknowledged that the population of freshwater turtles in the Brahmaputra River and Subansiri River has reduced over the years (Appendix II)



**Image 1 and 2:** Observed habitat types during the first and second phase of river survey



**Figure 6:** A pie chart displayed to show the anthropogenic disturbances along the Brahmaputra River



**Image 3:** Fishermen survey during the 1<sup>st</sup> phase of river survey

Various outreach programs (n=9), capacity building trainings (n=5), education cum awareness programs (n=9) and celebration of biological important days (n=7) were organised in the districts of Biswanath, Lakhimpur and Kamrup in Assam. A total of 2000+ people were sensitised on the conservation of Black Softshell Turtle and a group of 33 volunteers of college students and 19 forest officials were formed. Customised t-shirts on Black Softshell Turtle were made and provided in outreach stalls to help Nagsankar temple committee fundraise money for turtle feed. Interactive sessions like art competitions, 'Turtle Walk', documentary screening, cleanliness drive, signature campaigns pledging to save the Black Softshell Turtle with the participants and a street play 'Bringing back the Black Softshell Turtle' performed by the zoo keepers of Assam State Zoo cum Botanical Garden were the key highlights. Mr. Pranab Malakar, a dedicated turtle caretaker of Hayagriva Madhab Temple was felicitated as 'Turtle Warrior' with the other zoo keepers of Assam State Zoo in World Turtle Day (Appendix III)

For the health assessment, a team comprising of turtle biologist and veterinarians from TSA, and project team members assessed 15 individuals of *Nilssonia* species from Hayagriva Madhab and Nagsankar Temple. Prominent exoskeleton, bite wounds, algal growth and skin lesions were seen in the turtles of Madhab Temple. However, the sampled turtles in Nagsankar Temple lacked such precarious symptoms. Blood samples collected showed the presence of intraerythrocytic parasites in few individuals of Nagsankar Temple. A brief report including recommendations was submitted to all the concerned stakeholders. A total of 123 eggs were collected in the Nagsankar Temple during nesting season. The average temperature for the sampling period was  $24.7 \pm 1.08^{\circ}\text{C}$  (mean  $\pm$  SD) and the hatching rate was 38.2%. A recommendation plan on 'Conservation and Management of Turtles in Temple Pond in Assam' was drafted based on current state of information and several discussions with the stakeholders. The draft is currently under review with respective authorities.



**Image 4:** Morphometric measurement during health assessment at Hayagriva Madhab Temple



**Image 5:** Morphometric measurement during health assessment at Hayagriva Madhab Temple

A new grow-out facility for Black Softshell Turtle was developed jointly with TSA at the Nature Discovery Center in Biswanath Ghat. The facility will help to head start 200 softshell hatchlings every year until they reach a weight of 500 grams, at which point they will be released into the Brahmaputra Floodplain of Northeast India. The facility was recently inaugurated on the eve of World Wetlands Day 2023, inviting the local community members and other stakeholders from forest department and temple committee. This facility will also support the Black Softshell Turtle Vision 2030 goal to restore an ecologically viable population of 1,000 Black Softshell Turtles to the Brahmaputra Floodplain by the year 2030.



**Image 6:** A new grow-out facility for Black Softshell Turtle at the Nature Discovery Center

### **Communication and application of results (max 200 words)**

The habitat data and species distribution map generated from the river survey can be considered as one of the important quantitative study of the wild population of *N. nigricans* in the region. The final report was submitted to the Assam Forest Department and identified priority turtle habitats were recommended for designation as important sites future conservation actions and rehabilitation activities. The participatory conservation approach with key stakeholders was strengthened, furthering the local involvement in awareness and outreach campaigns. Various IEC materials were developed alongside installation of signage on turtle feeding guidelines for visitors (in English and Assamese). The extensive health assessment of the turtles in Shri Shri Hayagriva Madhab Temple and Nagsankar Temple led to the increased understanding on the underlying health constraints in *Nilssonia* species inhabiting temples, forming a scientific base for future studies in the region. Development of recommendation plan will help in husbandry management and the development of sand banks and improved feeding regimes for the captive population in collaboration with Biswanath District Administration, Kamrup District Administration and Assam Forest Department.

### **Monitoring and evaluation (max 200 words)**

A monthly and quarterly plan was prepared to ensure the completion of activities time lined. Moreover, weekly, monthly and quarterly team meetings were held and issues addressed were discussed thoroughly with the team members and advisors.

### **Achievements and Impacts (max 500 words)**

As proposed, the project was successful in gathering data on habitat suitability and occurrence data for the target species and other threatened freshwater turtle fauna in 277 sq km within the districts of Sonitpur, Biswanath and Lakhimpur. A total of 31 responses from fishermen during river survey and 150 responses on community perception were collected through close ended questionnaire, highlighting the attitude and perception toward freshwater turtles. Four nesting beaches were developed in Nagsankar Temple of Biswanath District and Shri Shri Hayagriva Madhab Temple of Kamrup District with the support from district administration and forest department, to aid in the improvement of husbandry conditions for the target species residing in the two temple ponds. Despite the pandemic restriction, we were able to reach out to 2000+ locals, with a conservation messaging of safeguarding the *N. nigricans* and their habitats. In total, we organised 9 outreach programs, 9 educational awareness programs and 5 capacity building trainings among various target groups such as temple committee members, schools/ colleges' students, members from local / fishing communities, forest department staff. A volunteer network for turtle conservation involving 33 college students from Biswanath and 19 forest officials was formed. They were provided with hands on training on identification, reporting, handling and rescuing a turtle using KURMA application. Over 500 leaflets and stickers were distributed among the target groups alongside installation of informational signage in the Nagsankar Temple. The project was instrumental in spreading conservation messaging to various stakeholders. We were further able to protect 123 eggs of the species around Nagsankar Temple. A Black Softshell Turtle nursery cum rearing facility was constructed at the Nature Discovery Centre in Biswanath Ghat. Emergent hatchlings will be kept for a year to eventually release them in the wild to ensure their long term survival. Scientifically backed recommendation action plan was drafted and will be soon circulated (post review) among the identified temple ponds housing turtles through the endorsement of Assam government.

### **Capacity development and leadership capabilities (max 250 words)**

As a young team in the field of conservation, this project provided us first hand field exposure and helped us with better understanding of both species biology as well as community perception to further the cause of this species in near future. The project significantly improved the research and leadership skills of the entire team. The team gathered both practical and theoretical knowledge in conducting field surveys, data collection and data analysis. Statesmanship and rapport building with key stakeholders was another accomplished skill. In addition to gaining expertise in GIS mapping and analytical thinking, the team developed overall confidence in organising events and meeting dignitaries.

### **Section 3:**

#### **Conclusion (max 250 words)**

The project was executed in the Brahmaputra landscape, which is among the five turtle priority areas in the country and is among the highest turtle diversity regions in the world. Given the fact that the last remaining wild populations of Black Softshell Turtle is dominant in the southern landscape of the Brahmaputra River and face some significant anthropogenic threats, it is crucial to implement strategic conservation actions and develop state level conservation action plan. The project was successful in providing some important findings such as on distribution, habitat suitability in the wild, as well as the current state of habitat quality and general health of this important species in temple ponds. Important intervention such as development of nesting beaches and regular dried fish feeding regimen was introduced with the help of district administration. Since the turtles are attached to the religious sentiments of the people, the project was also successful to an extent in bringing local communities and temple committees together through various outreach and awareness events. Continuous efforts were made to raise awareness among the locals while press media outreach was also done to enhance focus on the need of conservation of captive population of the Black Softshell Turtle. A new grow-out facility developed will help to head start 200 softshell hatchlings every year and also support the Black Softshell Turtle Vision 2030 goal to restore an ecologically viable population of 1,000 Black Softshell Turtles to the Brahmaputra Floodplain by 2030.

#### **Problems encountered and lessons learnt (max 500 words)**

One of the life changing experiences was the river survey, where we have gained practical knowledge on turtle nest searching and have come across ethnic diversities. Interaction with multiple stakeholders resulted in varied approaches and outcomes. Time and team management was quite challenging, however that helped us grow individually and collectively. Another challenge was conducting a program within the proposed timeframe, involving multiple stakeholders, but was gradually achieved in consultation with the project advisor.

Further, as listed under **objective 3**, the activity on the 'monitoring of nesting of the targeted species in the temple ponds and their hatchlings' led to the protection of a total of 123 eggs from 16 nests in Nagshankar temple. Unfortunately, both the temples lack any nursing/rearing facility for these hatchlings, and any expertise thus would compromise their post hatching survival. A dedicated nursery cum rearing facility is developed at NDC to overcome this problem. This would help to rear

the emergent hatchlings for at least a year before their release to the wild to increase their survival and enhance the population recruitment in the wild.

**In the future (max 200 words)**

The findings of the project and scientific publications to be done from the study under the various objectives will provide baseline information to the various stakeholders in the region as Assam Forest Department, District Administration and other conservation agencies as well as budding researchers to build further comprehensive projects and scientific studies to further the cause of conservation of this important turtle species. The BST hatchling facility will help raise and increase survival of hatchlings for wild supplementation in the identified ‘priority habitats’ inside the protected areas, initially and eventually all across its range in the state. The management plan will soon be circulated through the endorsement of government partners and implemented across the temple ponds to strengthen husbandry and health of housed turtle all across the state of Assam.

**Financial Report**

Itemized expenses	Total CLP Requested (USD)*	Total CLP Spent (USD)
<b>PHASE I - PROJECT PREPARATION</b>		
Communications (telephone/internet/postage)	164.00	142.44
Field guide books, maps, journal articles and other printed materials	218.00	21.19
Insurance	137.00	128.35
Visas and permits		
Team training		
Reconnaissance	1,392.00	1055.17
Other (Phase 1)		
<b>EQUIPMENT</b>		
Scientific/field equipment and supplies	2,475.00	1365.08
Photographic equipment	500.00	318.86
Camping equipment	774.00	445.89
Boat/engine/truck (including car hire)	1,350.00	519.22
Other (Equipment)	136.00	125.24
<b>PHASE II - IMPLEMENTATION</b>		
Accommodation for team members and local guides	1,233.00	1398.00
Food for team members and local guides	2,740.00	2235.15
Travel and local transportation (including fuel)	406.00	355.83
Customs and/or port duties		

Workshops	1027	942.82
Outreach/Education activities and materials (brochures, posters, video, t-shirts, etc.)	1,009.00	115.89
Other (Phase 2)		157.87
<b>PHASE III - POST-PROJECT EXPENSES</b>		
Administration		
Report production and results dissemination	150.00	144.04
Other (Phase 3)	686.00	800.49
<b>Total</b>	<b>14,397.00</b>	<b>10,271.54</b>



## Section 4:

### Appendices

#### Appendix I: CLP M&E measures table

Output	Number	Additional Information
Number of CLP Partner Staff involved in mentoring the Project	-	
Number of species assessments contributed to (E.g. IUCN assessments)	-	
Number of site assessments contributed to (E.g. IBA assessments)	-	
Number of NGOs established	-	
Amount of extra funding leveraged (\$)	-	
Number of species discovered/rediscovered	-	
Number of sites designated as important for biodiversity (e.g. IBA/Ramsar designation)	-	
Number of species/sites legally protected for biodiversity	-	
Number of stakeholders actively engaged in species/site conservation management	Six	District administration, Assam Forest Department, Conservation agencies, Temple committee, academic institutions, local community
Number of species/site management plans/strategies developed	One	A conservation action plan has been drafted.
Number of stakeholders reached	Eight	
Examples of stakeholder behaviour change brought about by the project.		Rescue calls increased. Local communities and the temple committees welcomed feeding dried fishes to the turtles in the temple ponds, irrespective of the religious beliefs.
Examples of policy change brought about by the project		With the help of district administration, signages were installed and dried fish feeding was implemented and overall husbandry development in the temple ponds.
Number of jobs created		
Number of academic papers published		
Number of conferences where project results have been presented		

**Appendix II: Priority habitat in the Brahmaputra River for focused conservation action**

SI No .	Latitude	Longitude	Sandy shoreline	Muddy shoreline	Shoreline with vegetation	Anthropogenic disturbance	Number of turtles sighted
1	26°40'53.64"N	93°13'52.42"E	86%	0%	14%	Medium	6
2	26°46'26.98"N	93°24'36.91"E	50%	0%	50%	No	256
3	26°44'24.76"N	93°28'31.34"E	50%	0%	50%	Low	26
4	26°43'7.97"N	93°33'17.01"E	40%	20%	40%	No	13
5	26°47'42.49"N	93°44'45.95"E	33%	67%	0%	Low	2
6	26°54'18.16"N	93°56'38.40"E	20%	40%	40%	High	1
7	26°36'59.89"N	93° 4'2.05"E	0%	0%	100%	No	13
8	26°37'6.39"N	93° 1'33.66"E	0%	0%	100%	No	1
9	26°37'28.05"N	93° 1'5.75"E	80%	0%	20%	No	1
10	26°36'31.11"N	92°44'23.25"E	0%	0%	100%	No	6
11	26°36'8.48"N	92°43'54.70"E	100%	0%	0%	No	2
12	26°35'7.36"N	92°41'27.99"E	60%	0%	40%	No	19
13	26°34'48.08"N	92°40'56.76"E	0%	100%	0%	No	10
14	26°32'56.06"N	92°43'36.33"E	0%	0%	100%	No	5
15	26°37'28.61"N	92°57'47.50"E	0%	100%	0%	No	7

### Appendix III: List of events organised for various stakeholders

SI No.	Type of event	Type of stakeholders/participants	Brief description	Number of events	Number of participants
1	Outreach programs held in the district of Biswanath and Lakhimpur	Temple committee, forest staff, fishermen, local communities and general public	Dedicated outreach stalls and board exhibits were set up to sensitise people about Black Softshell Turtle, their conservation and ecology. People were advised to reduce littering in the temple ponds and other water bodies	9	893
2	Capacity building trainings in the district of Kamrup and Biswanath	Veterinarians, forest staff, teachers, college students and general public	A virtual webinar on veterinary practices for turtles was organised and the talk was led by an experienced reptile veterinarian. Hands on training on nest protection and rescue protocol of freshwater turtle species were provided to the forest staff. Informative session on Black Softshell Turtle, KURMA app and its usage was delivered to the forest staff, students, teachers and general public	5	167
3	Education cum awareness programs in the district of Biswanath and Kamrup	School students and teachers	Information on turtle diversity, common misconceptions, threats and conservation issues of Black Softshell Turtle were delivered	9	540
4	Celebration of various biological important days in the district of Biswanath and Kamrup	State politician, Assam Forest Department, government officials, zoo keepers, wildlife NGOs, temple committee, students, teachers, local communities, local media	Felicitation programs, signature campaigns, interactive sessions in the form of art competitions, screen plays, street plays, cleanliness drive and public talks highlighting the conservation of Black Softshell Turtle	7	417

## Appendix IV

### 1. Morphometric details of the turtles sampled from Shri Shri Hayagriva Madhab Temple

Tag No.	Species	Sex	CL (cm)	CW (cm)	PL (cm)	BT (cm)	CT (cm)	Height (cm)	BM (kg)
590	<i>N. nigricans</i>	M	62.7	49	48.4	28	7.3	-	40
592	<i>N. nigricans</i>	M	68.5	48.7	50.3	30.7	8	-	65
594	<i>N. nigricans</i>	M	66	50.3	48	34.4	8.4	-	40
573	<i>N. nigricans</i>	M	57.6	42.2	42	22.9	5.6	17.4	21
599	<i>N. nigricans</i>	F	42.6	31.6	31.3	15.6	3.4	13.4	10.2

M-male, F-female, CL- Carapace length, CW- Carapace width, PL- Plastron length, BT- Base of the plastron to tip of the tail, CT- Cloaca to tip of the tail

### 2. Morphometric details of the turtles sampled from Nagsankar Temple

Tag No.	Species	Sex	CL (cm)	CW (cm)	PL (cm)	BT (cm)	CT (cm)	Height (cm)	BM (kg)
801	<i>N. nigricans</i>	F	55.8	43.5	41.8	28.5	6.8	15.7	29.35
803	<i>N. nigricans</i>	M	61.5	47.5	46.7	30.4	55.87	19.9	32.34
808	<i>N. nigricans</i>	F	38.4	31.3	31	12.7	1.5	13.5	8.590
805	<i>N. nigricans</i>	M	60.5	45.7	46.8	28.7	6.57	16.5	25.80
809	<i>N. nigricans</i>	M	56.4	46.9	43.8	26.4	6.2	17.4	26.9
810	<i>N. nigricans</i>	M	45.4	36.3	35	18.9	5.11	13.5	13.58
814	<i>N. nigricans</i>	F	37.7	30.4	28.7	12.1	2.36	14.3	8.910
815	<i>N. nigricans</i>	M	52.6	41.2	41.4	23.7	4.06	16.8	23.67
806	<i>N. nigricans</i>	M	54.6	40.1	39.5	24.2	4.65	18.5	22.6
865	<i>N. nigricans</i>	F	37.8	31.2	29.1	12.3	1.90	13.4	9.55

M- male, F- female, CL- Carapace length, CW- Carapace width, PL- Plastron length, BT- Base of the plastron to tip of the tail, CT- Cloaca to tip of the tail

**Appendix V: Diversity of freshwater turtles observed in the temple ponds visited as a part of the project in Assam**

Location	Species name	Status
Nagsankar Temple, Biswanath	Black Softshell Turtle ( <i>Nilssonia nigricans</i> )	CR
	Indian Peacock Softshell Turtle ( <i>Nilssonia hurum</i> )	EN
	Indian Softshell Turtle ( <i>Nilssonia gangetica</i> )	EN
	Indian Flapshell Turtle ( <i>Lissemys punctata</i> )	VU
	Indian Narrow-headed Softshell Turtle ( <i>Chitra indica</i> )	EN
	Black Spotted Turtle ( <i>Geoclemys hamiltonii</i> )	EN
	Assam Roofed Turtle ( <i>Pangshura sylhetensis</i> )	CR
	Indian Roofed Turtle ( <i>Pangshura tecta</i> )	VU
	Indian Tent Turtle ( <i>Pangshura tentoria</i> )	LC
	Brown Roofed Turtle ( <i>Pangshura smithii</i> )	NT
Hayagriva Madhab Temple, Hajo, Kamrup	Black Softshell Turtle ( <i>Nilssonia nigricans</i> )	CR
	Indian Peacock Softshell Turtle ( <i>Nilssonia hurum</i> )	EN
	Indian Softshell Turtle ( <i>Nilssonia gangetica</i> )	EN
	Indian Flapshell Turtle ( <i>Lissemys punctata</i> )	VU
	Indian Narrow-headed Softshell Turtle ( <i>Chitra indica</i> )	EN
	Black Spotted Turtle ( <i>Geoclemys hamiltonii</i> )	EN
	Assam Roofed Turtle ( <i>Pangshura sylhetensis</i> )	CR
	Indian Roofed Turtle ( <i>Pangshura tecta</i> )	VU
	Indian Tent Turtle ( <i>Pangshura tentoria</i> )	LC
	Brown Roofed Turtle ( <i>Pangshura smithii</i> )	NT
	Indian Eyed Turtle ( <i>Morenia petersi</i> )	EN
	Southeast Asian Box Turtle ( <i>Cuora amboinensis</i> )	EN
	Tricarinate Hill Turtle ( <i>Melanochelys tricarinata</i> )	EN
	Crowned River Turtle ( <i>Hardella thrujii</i> )	EN
	Keeled Box Turtle ( <i>Cuora mouhotii</i> )	EN
	Indian Black Turtle ( <i>Melanochelys trijuga</i> )	LC
	Assam Leaf Turtle ( <i>Cyclemys gemeli</i> )	NT
Kalasthan Maa Kali Mondir, Dhekiajuli, Sonitpur	Black Softshell Turtle ( <i>Nilssonia nigricans</i> )	CR
SingriGupteshwar Mandir, Sonitpur	Black Spotted Turtle ( <i>Geoclemys hamiltonii</i> )	EN

**CR – Critically Endangered, EN- Endangered, VU- Vulnerable, NT- Near Threatened, LC- Least Concern**

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Wildlife Week celebration 2021 at Hayagriva Madhab Temple, Hajo



Stakeholder meeting with Biswanath district authority, Biswanath



Stakeholder meeting with Nagsankar Temple committee, Biswanath



Stakeholder meeting in Hajo Temple



Water monitoring at Nagshankar Temple, Biswanath



Conducting survey among devotees in Hayagriva Madhab Temple, Hajo



Flood Awareness camp in progress, Baghmari, Biswanath



Teaching fringe villagers KURMA app Jorabari, Biswanath



Outreach program at Nagsankar temple on the occasion of Shivratri Festival



Banner inauguration in presence of ADC, Biswanath at Nagsankar Temple





Education Awareness Program, MRA High School, Baghmari



Education Awareness Program in Hajo



World Turtle Day celebration at Assam State Zoo Cum Botanical Garden,



Turtle Watch on the occasion of World Turtle Day at Ugratara temple, Guwahati



Cleanliness drive on the occasion of World Turtle Day at Nagsankar Temple, Biswanath



World Turtle Day celebration at Nagsankar Temple, Biswanath



Capacity Building training program among college students, Biswanath College, Biswanath



Nest protection, egg collection and monitoring at Nagsankar Temple



Fishermen survey along the Brahmaputra River



Foot prints of Softshell Turtle in one of the riverine chars in Kaziranga National Park

**Outreach Materials: Leaflets, stickers distributed and signage installed**

## Black Softshell Turtle





Scientific Name: *Nilssonina nigricans*  
 Phylum: Chordata  
 Class: Reptilia  
 Order: Testudines  
 Family: Trionychidae

**CONSERVATION STATUS**  
 IUCN: Critically Endangered  
 IWPA: Schedule IV  
 CITES: Appendix I




**Distribution:** India (Assam, Nagaland, Arunachal Pradesh), Bangladesh

**Habitat:** Medium to large rivers (wild), temple ponds (captive)

**Diet:** Carnivorous (fishes, mollusks, crustaceans)

**Nesting:** March - May

**Clutch Size:** 10-38 eggs

**Adult Weight:** upto 40.2 kg

**Adult Shell Range:** upto 78 cm length



TURTLES ARE HISTORICALLY CONSERVED IN MANY TEMPLE PONDS OF ASSAM, WHERE RESERVOIRS AND WATER BODIES ARE CONSIDERED SACRED. POPULAR AMONGST THEM ARE HANRIS MADHAS TEMPLE AT HAJO, NAGSHANKAR TEMPLE AT SISWANATHI, NAA KANAKIYA TEMPLE AND UGRATARA TEMPLE IN GUWANATHI, AND MANY OTHERS HOLDING IN DIFFERENT SPECIES OF TURTLE POPULATION.

 **SAVE OUR HABITATS**  
 TAKE CARE OF MY NATURAL DIET  
 REPORT TURTLES AROUND YOU ON KURMA APP  
 INFORM THE NEAREST FOREST OFFICE

 **CREATE PLASTIC POLLUTION**  
 DEGRADE WETLANDS  
 EAT US OR ENCOURAGE ILLEGAL TRADE  
 FEED ME PUFFED RICE AND BISCUITS IN TEMPLES

TSA Program Office: FF- D-317, Sector F, Janakipuram, Lucknow Uttar Pradesh, India - 226021  
 Tele-Fax: +91-522-4001167  
 E-mail: tsa.infpprog@gmail.com

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# INSTRUCTIONS FOR VISITORS



As we all are playing our part in the Swachh Bharat Mission, it is a duty of every visitor to follow.

## DO'S

- ❑ Appreciate and support the conservation effort of the community for the turtles and the pond.
- ❑ Spread the message of the conservation effort of the community for the turtles and the pond.
- ❑ Encourage fellow visitors in up-keeping the decorum of the place and cleanliness of the surroundings.
- ❑ Observe, enjoy and learn from your experience. The turtles in the pond will give you a glimpse of their behavior.
- ❑ Keep a safe distance from turtles. They may injure you. It is not their mistake, it is you, who are too close for comfort.

**Time of feeding**  
Morning 9:00 am to 2:00 in the afternoon

## DONT'S

- ❑ Do not litter in the temple and pond premises. Littering in the pond is strictly prohibited. Keep them clean as your home.
- ❑ Do not feed the turtles in the pond anything which is banned. It is your responsibility to keep the good health of them.
- ❑ Do not feed the turtles after the designated feeding time. You can always come tomorrow.
- ❑ Do not disturb the turtle while basking, avoid proximity.
- ❑ Hitting turtles with pebbles/stones is a punishable offence. The turtles are at peace, and you don't have any right to disturb them.

*Be a flagbearer and play your part in conservation*



<https://turtlesurvival.org/>  
[tea.indiaprog@gmail.com](mailto:tea.indiaprog@gmail.com)

## Feeding guidelines for the turtles of the temple pond

Black Softshell Turtle (*Apalone nigriventris*) is a carnivorous species, needs protein in the form of fish (live or dried) for its health and survival.

काला नरम-कवच कछुआ (*Apalone nigriventris*) एक मांसाहारी प्रजाति है जो अपने स्वास्थ्य और जीवित रहने के लिए प्रोटीन (जीवा या सूखे) की आवश्यकता रखता है।



Turtles bask in the sun for maintaining body heat and also digest their food during day time when the temperature is high. Therefore, feeding is not done during afternoon and evening.

कछुआएँ सूर्य में गर्मी बनाए रखने के लिए और उच्च तापमान के दौरान अपने भोजन को पचाने के लिए दिन के समय में सूर्य में गर्म होना पसंद करते हैं। इसलिए, दोपहर और शाम के समय में भोजन नहीं दिया जाता है।

Do not over feed the turtles, as the extra food will be deposited in the bottom and its degradation will degrade the water quality. The green algal bloom is the indicator of polluted water in the pond.

कछुआओं को अतिरिक्त भोजन न दें, क्योंकि अतिरिक्त भोजन तट पर जमा होगा और इसकी क्षय-पक्षय पानी की गुणवत्ता को खराब करेगा। हरी शैवाल का फूल पानी में प्रदूषण का संकेतक है।

**Time of feeding**  
Morning 9:00 am to 2:00 in the afternoon

भोजन देने का समय  
सुबह 9:00 बजे से दोपहर 2:00 बजे तक



Feed with live fish (consult fisheries department before releasing live fish) & dry fish

जीवंत मछली (मछली विभाग से सलाह लेने के बाद जीवंत मछली छोड़ें) और सूखे मछली



Avoid biscuits, puffed rice, soy chunks

बिस्किट, फुफे, सोया चंक्स



<https://turtlesurvival.org/>  
[tea.indiaprog@gmail.com](mailto:tea.indiaprog@gmail.com)

Copies of media articles relating to the project



- <https://turtlesurvival.org/tsa-celebrates-world-wetlands-day-in-the-best-way/>
- <https://www.sentinelassam.com/topheadlines/1000-black-softshell-turtles-to-be-released-back-into-the-wild-593351>
- <https://www.eastmojo.com/assam/2022/02/03/assam-59-hatchlings-of-black-softshell-turtles-released-in-chandubi-lake/>
- <https://www.facebook.com/107239535099001/posts/170287975460823/?sfnsn=wiwspmo>
- <https://fb.watch/dcjAWDfC09/>
- <https://fb.watch/eMTiieAHZM/>