ZSL
LET'S WORK FOR WILDLIFE

EDGE

EVOLUTIONARILLY DISTINCT & GLOBALLY ENDANGERED

Survival Blueprint

Cantor's Giant Softshell turtle, *Pelochelys cantorii*

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1. STATUS REVIEW

1.1 Taxonomy:

Class	: Reptilia
Order	: Testudines
Family	: Trionychidae
Genus	: *Pelochelys*
Species	: *Pelocheys cantorii* (Gray, 1864)
Common Name	: Cantor's Giant softshell turtle/ Asian Giant softshell turtle/
Local name	: Bheemanama, Paala poovan (Malayalam)

Synonyms: *Pelochelys clivepalmeri* (Hoser, 2014), *P. cumingii* (Gray, 1864), *P. poljakowii* (Strauch, 1890), *P. telstraorum* (Hoser, 2014), *P. cantoris* (Boulenger, 1889)

Pelochelys cantorii (Gray, 1864) is one of the three species in the genus *Pelochelys*. The other two species are *P. bibroni* and *P. signifera* known only from Papua New Guinea and Indonesia (Papua), respectively. *P. cantorii* has a large distribution across south and south-east Asia (Das, 2008). It is among the largest freshwater turtles in the world with adults reaching a carapace length of around 100 cm (Das, 2008). Sexual dimorphism is present with males having longer and thicker tales than females; something common for other softshell turtles. Females are also larger in size than males (Das, 2008).
According to the last IUCN Red List of threatened species assessment for the species, *Pelochelys cantorii* might hide a complex of several different species (ATTWG, 2000)

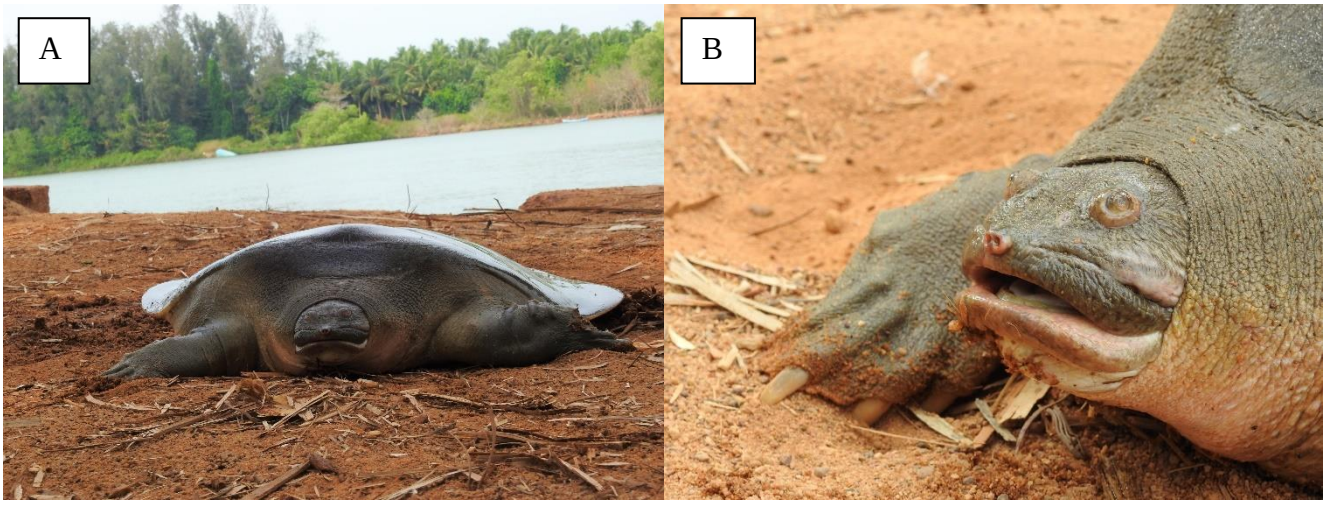

Figure 1. An adult *Pelochelys cantorii* on the banks of Chandragiri river caught as by-catch in a fishing line (A), and a close-up head shot showing the keratinized sheath or "teeth" of the species (B).

1.2 Distribution and population status:

Pelochelys cantorii has a widespread distribution occurring in as many as 11 countries across South and South-east Asia (Das, 2008). It is a freshwater turtle species with a wide distribution (Das, 2008); though it is also considered uncommon. There are no estimates of population size or relative abundance of the species across its distribution range, with data limited to sighting reports. A two-week market survey in Bangladesh reported 30 specimens of the species (Das, 2008). In India, no population estimates have been made to date and the species is considered rare with fragmented populations. It is assessed as 'Endangered' by the IUCN Red List of Threatened Species (Asian Turtle Trade Working Group, 2000).

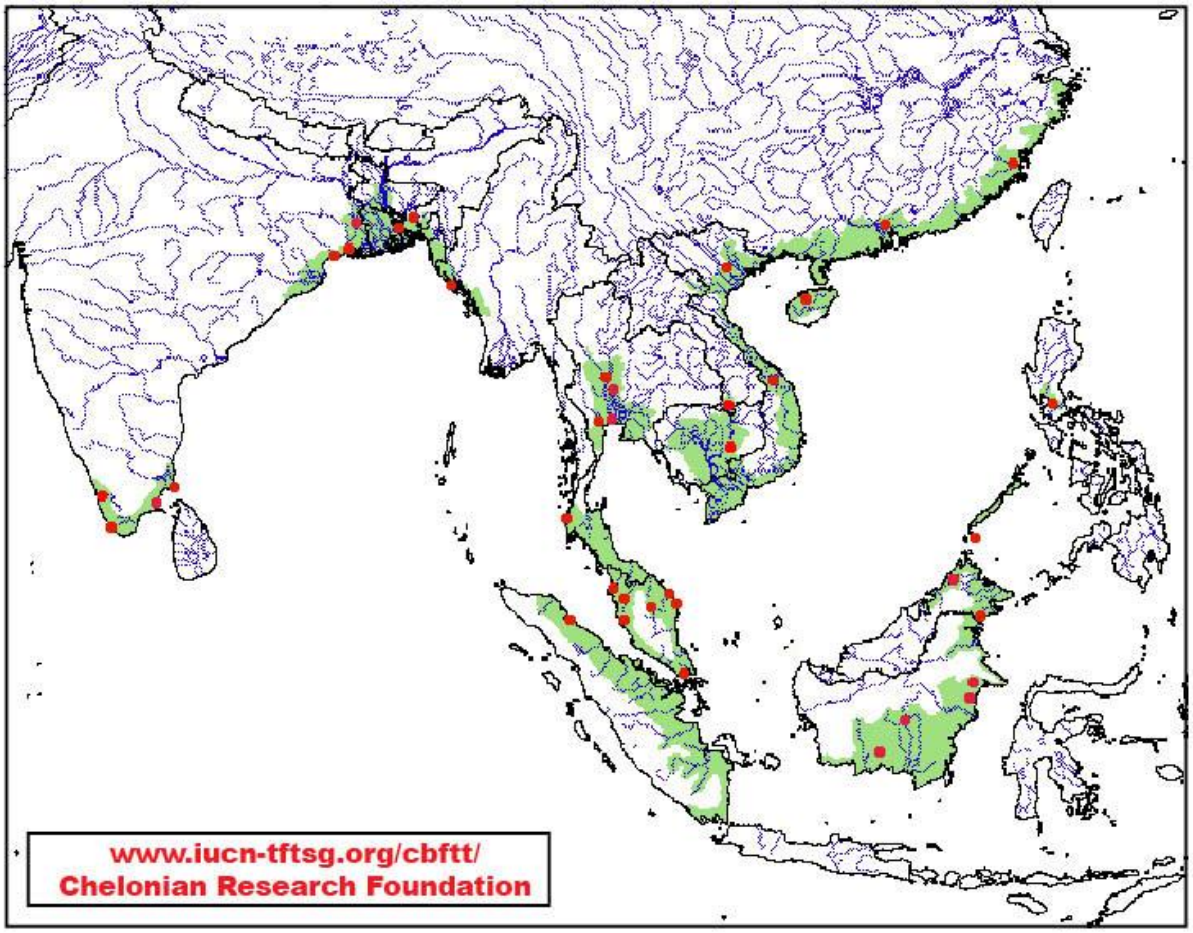

Figure 2. *Pelochelys cantorii* distribution in South and Southeast Asia. Source: Das, 2008.

1.2.1 Global distribution:

Country	Population estimates (plus references)	Distribution	Population trend (plus references)	Notes
India	Unknown	Kerala, Tamil Nadu, Odisha, West Bengal, Andhra Pradesh, Karnataka (?)	Unknown	In Kasaragod district of Kerala, five individuals incidentally caught in fishing gear have been rescued within a span of 10 river kms. (Jain, unpublished)
Bangladesh	Unknown (IUCN Bangladesh, 2015)	Lower Ganges system Comilla/Meghna, Sundarbans river system, Bhola, Pirojpur, Pataukhali, Barisal and Khulna.	Decreasing	Regional status of the species in Bangladesh is 'Critically Endangered' (Rashid and Khan, 2000).
Cambodia	Unknown	48-km stretch of the Mekong river in Kratie and Stung treng provinces.	Unknown	565 hatchlings were released after nest protection program in Cambodia in 2018.
China	Unknown	Yunnan, Jiangsu, Zhejiang, Fujian, Guangdong, Hainan, and Guangxi provinces in central and south China. Historical occurrence- Anhui	Decreasing	Lau and Shi, 2000; Das, 2008; Xiaoyou et al., 2019
Thailand	Unknown	Restricted to Peninsular region of Thailand, Thai Part of Mekong River is not confirmed.	Decreasing. Extinct from Chao Phraya and Mae Klong systems.	van Dijk and Palasuwan, 2000; Boulenger, 1890.
Philippines	Unknown	Islands of Luzon (Cagayan River and Ilaguen River) and Mindanao (Agusan Marsh	Unknown Species is considered to be	Diesmos et al., 2008

		Wildlife Sanctuary and the Panabo River, Davao del Norte Province) Historical records- Island of Balabac, San Miguel River, Laguna de Bay	uncommon to rare.	
Malaysia	Unknown	Setiu district, Kuala Besut Jetty and Kemaman	Unknown	Shahirah-Ibrahim et al., 2018; Das, 2008; Sharma and Tisen, 2000
Laos	Unknown	Champasak Province, Khong District, Ban Hang Khone Village in Mekong River	Decreasing	Population very small and nearing extinction (Touch Seang Tana et al., 2000) Stuart and Timmins, 2000; Stuart and Platt, 2004
Indonesia	Unknown	Sumatra, Borneo, Irian Java, Sulawesi, Berbak National Park	Unknown	Samedi and Iskandar, 2000
Vietnam	Unknown	Central and Southern Vietnam	Unknown	Populations are likely to be decreasing. Touch Seang Tana et al., 2000 suspects Vietnam populations to be likely extinct.
Myanmar	Unknown	Unknown	Unknown	Boulenger, 1889; Das 2008

1.2.2 Local distribution in India:

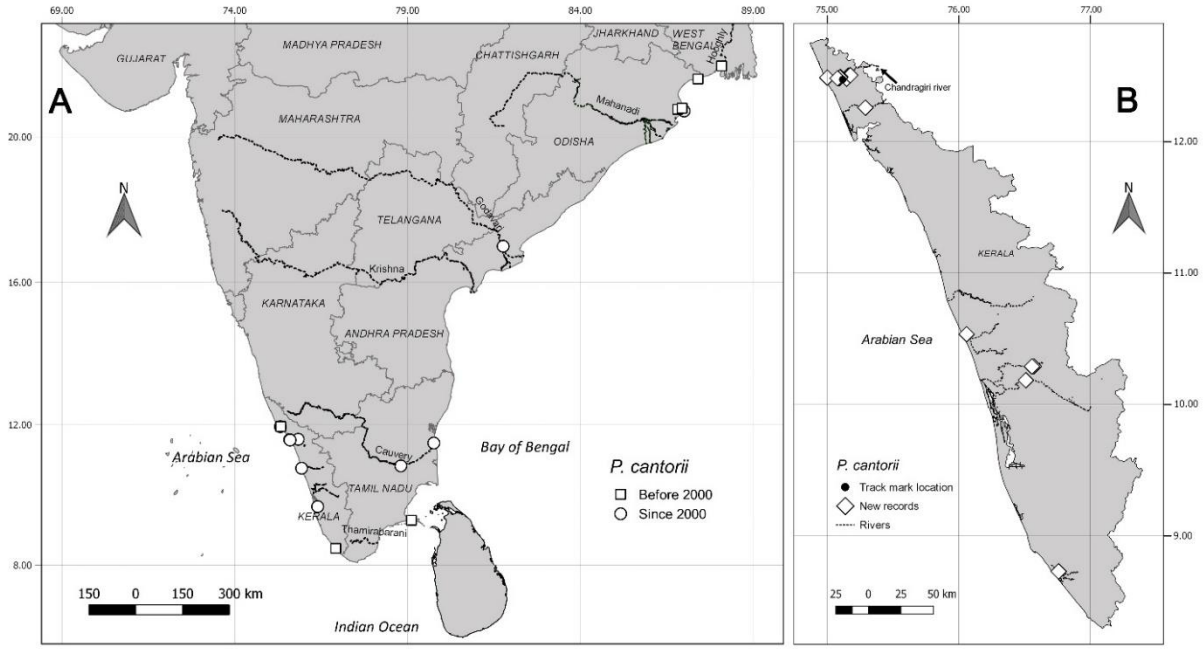

Figure 3. Published distribution records of *Pelochelys cantorii* in India 1780–2000 (□) and 2000–2020 (○) (A) and new distribution records of *P. cantorii* in Kerala since 2008 (B).

Region / province	Site	Level of Protection	Population size	Reference(s)	Notes
Tamil Nadu	Palk Bay	Unknown	Unknown	Nair and Badrudeen, 1975; Moll and Vijaya 1986	One individual caught in a trawl net from estuarine habitat.
	Mouth of Vellur estuary	None	Unknown	Hussain, 2003	One individual was found stranded on the coast.
	Cauvery river	None	Unknown	Melvinselvan and Nibedita 2017	The report is the most inland occurrence from India (ca. 90 km from the sea).
Kerala	Chandragiri river	None One particular site, Neyyamkayam was declared as Biodiversity Heritage Site. However, it does not provide any known protection to the aquatic biodiversity.	Unknown	Jain et. al., 2021 (unpublished)	This site might be one of the strongholds for this species population.

	Valapattanam river	None	Unknown	Palot and Radhakrishnan, 2002	
	Bharathapuzha river	None	Unknown	Kumar, 2004	
	Kuttiyadi river	None	Unknown	Palot, 2003; Palot and Radhakrishnan 2011	
	Chettuva Lake	None	Unknown	P.O. Nameer, pers. comm., 2008	
	Vembanad Lake	Ramsar Site	Unknown	Badush and Palot, 2020	
	Chalakudy River	None	Unknown	B.K. Vasudevan, pers. comm., 2015; S. Das, pers. Comm., 2017;	
	Thejaswini River	Unknown	Unknown	J. Padikkal, pers. comm., 2016	
	Periyar River	Part of this river falls within Periyar Tiger Reserve, a protected area	Unknown	S. Das, pers. comm. 2017	
	Varkala	None	Unknown	Vismaya Channel News report, 2019	
Andhra Pradesh	Godavari river	None	Unknown	Sirsi, 2010	
Odisha	Subarnarekha River	None	Unknown	Moll and Vijaya 1986	
	Mouth of Maipara river	None	Unknown	Behera et al. 2019	
	Brahmani-Baitarani Delta	None	Unknown	Kar and Rao, 1985; Vijaya, 1982; Behera et al. 2019	
West Bengal	Hooghly river	Unknown	Unknown	Annandale 1912	Hooghly river is partly protected under Sundarbans PA. However, the location of the report does not specify specific region.

1.3 Protection status:

The Cantor's Giant Softshell turtle is currently listed within Appendix II of CITES, therefore its international trade is regulated. The species is protected in India under the Schedule I of the Indian Wildlife (Protection) Act, 1972, which is the highest protection level for a species in the country. The species has been protected in other parts of its distribution range, specifically in Vietnam, Myanmar, Philippines, Bangladesh and China but with varying degrees of protection. It is also protected from exploitation in Thailand under WARPA law (Wild Animals Reservation and Protection Act B.E. 2535) (van Dijk and Palasuwan, 2000). In India, the formal protection provided to the rivers is negligible except to the parts when they flow through designated National parks or sanctuaries. All 18 sites where the historic and contemporary sightings of the species have been documented fall outside of any Protected Area Network. However, due to the lack of in-depth studies and information on the species' home range, habitat use and requirements, it is difficult to estimate the proportion of the species range that might be falling under the Protected Area Network.

1.4 Ecology, behaviour, and habitat requirements:

Pelochelys cantorii is a highly aquatic freshwater species with a seemingly high salinity tolerance as it has been reported in estuarine and coastal waters (Das, 2008). The species is considered very secretive and can spend large part of its life underwater, buried under the sand in the riverbed. This species has a large distribution in South-East Asia but is considered 'rare' across its range. The limited information on the species' ecology and biology comes mainly from captive individuals. Knowledge on individuals and populations in the wild is scarce.

Nesting ecology varies greatly across its range with respect to nesting grounds and nesting season (Das 2008). In China, mating between a male and a female was observed between April and June in captivity followed by nesting between June and September with one female depositing three clutches with an interclutch interval of 15 days (Xinping, 2015). Das (2008) also mentions May– September as the breeding and nesting period of wild *Pelochelys cantorii* in the Oujian River drainage of China and the clutch size was reported to range between 40–70 eggs with a mean egg size of 3 cm. In Cambodia, on the sandbanks of the Mekong river, nesting takes place between December and January with a clutch size raging in between 34-42 eggs (Das, 2008; Gnourn and Som, 2019). In India, nesting on coastal beaches has been reported (Kar and Rao, 1985) but being "heavier on the river side" (Vijaya, 1982) - the season was not given in these reports. Aside from this report, no other evidence of the species nesting ecology in India has been published. Palot and Radhakrishnan (2011) assumed that nesting occurs post-monsoon (August–October) coinciding with the estuarine records of the species during this period. In the Chandragiri river, nesting seems to occur in January–February on the riverbanks (Jain, *pers. obs*). The clutch size from one nest found in January 2020 was reported to have 40 eggs while the clutch sizes from three nests laid between 24th

January– 14th February 2021 were 40, 29, 29 eggs, respectively (Jain, *pers. obs*). Three clutches were laid on a single riverbank within a period of 15 days. It takes between two to three months for hatching to occur (Som, *comm. pers*., Das, 2008; Xinping et. al., 2015). Information on breeding behaviour is not yet known for India's population(s).

The species is known to inhabit deep pool areas (Som et.al., 2006) with sand substrate. The behaviour of the species is often described as 'aggressive' because of the rapid strike movement of the head and powerful jaw. It is also an ambush feeder. With its widely spaced eyes on top of the head and the body still buried in the sand, it waits for prey to pass by before rapidly catching it while protruding its neck (Das, 2008). The species is known to feed on fish, shrimps, crabs and molluscs in addition to plants in captivity. It is also known to feed on dead and decaying matter in Chandragiri river (Jain, unpublished).

1.5 Threat analysis:

Threat	**Description of how this threat impacts the species**	**Intensity of threat** *(low, medium, high, critical or unknown)*	**IUCN Red List Threat category**
Habitat Alteration	Rivers are modified as water is increasingly used for irrigation. Agricultural runoff also alters water quality and increases suspended matter, impacting submerged vegetation (van Dijk, 2000; Jain, *pers. obs*).	Medium	2.1.2 Small-holder Farming (Mainly Coconut, Areca nut and rubber plantation)
Sand mining	Continuous pressure from sand mining changes the river morphology and destroys nesting grounds and nests (van Dijk, 2000; Gnourn and Som, 2019; Jain, *pers. obs).*	Critical	3.2 Mining & Quarrying
Dam and check dams	Dams can cause flooding of sand banks leading nests to be drowned during nesting periods (Jain, *pers. obs*). Check dams and dams also hinder the movement of individuals along the river, potentially acting as barriers (van Dijk, 2000; van Dijk and Palasuwan, 2000).	Critical	7.2.1 Abstraction of Surface Water (domestic use) 7.2.3 Abstraction of Surface Water (agricultural use)
Consumption of meat and eggs	Target killing for the turtle's meat and eggs pose a great threat to the species survival across its range (Xiaoyou et al., 2019).	High	5.4.1 Intentional Use: subsistence/small scale (species being assessed is the target) [harvest]

By-catches	The species is often caught in hooks and nests as by-catch (Jain, pers. obs). Commonly, fishers kill the turtle for opportunistic consumption. In cases when turtles are released, the hooks are not removed which could be fatal when individuals are back in the wild (Jain, pers. obs).	High	5.4.3 Unintentional effects: subsistence/small scale (species being assessed is not the target) [harvest]
Illegal trade	Trade of the species (live turtle shipments) has been documented in Indonesia and Malaysia (Shepherd, 2000; Sharma and Tisen, 2000; Das, 2008). The species has also been seen in local markets of Bangladesh in the late 1980s (Bhupathy et. al., 2000; Chakma, 2015). However, the intensity of the threat is unknown.	Unknown	5.4.1 Intentional Use: subsistence/small scale (species being assessed is the target) [harvest]
Over-fishing	Overfishing can affect the species through trophic cascades, reducing the abundance of preys (Das, 2008)	Unknown	2.3.8 Indirect Species Effects - Other
Water pollution	Chemical and organic pollution from agricultural fields and industrial waste can cause indirect threats to species ecology (Sharma and Tisen, 2000; Das, 2008).	Unknown	9.3.2 Soil Erosion, Sedimentation 9.3.1 Nutrient Loads

1.6 Stakeholder analysis:

Country	**Stakeholder**	**Stakeholder's interest in the species' conservation**	**Current activities**	**Impact** *(positive, negative or both)*	**Intensity of impact** *(low, medium, high or critical)*
International	Wildlife Institute of India (WII), Zoological Society of London (ZSL), EDGE of Existence Programme, Zoological Survey of India (ZSI), Mohamed Bin Zayed Species Conservation Fund.	Conservation and research	Support in terms of funding for the project and supervision of the project. Collaborations in research, international exposure for the species.	Positive due to collaborative efforts for the conservation of the species, access to international resources and knowledge.	High
Cambodia	Wildlife Conservation Society	Research and Conservation	Ongoing nest protection and hatchling release program for the species	Positive due to their expertise with the species conservation and management, specifically nest protection and community role in species protection.	High
India	Agricultural Farmers	Indirect, Use of the species' habitat as an important resource, mainly for irrigation.	Holds knowledge on the species and more likely to interact with the species.	Both, Negative impact on the species habitat because of habitat alteration and irrigation pumps underwater. Positive impact on sharing local ecological knowledge and species sighting information.	High
India	Fishers	Consumption of turtle's meat and eggs.	Hold knowledge on the species ecology and presence.	Both Negative impact on species population due	High

		Species by-catches in their hooks and nets.		to over-fishing and catching live turtles. Positive as there is an opportunity to include them towards conservation of the species and increase sustainability in their fishing practices.	
India	Local communities	Indirect. Species conservation might attract national attention to the villages.	Involving the local communities in various awareness and outreach activities and strengthen the network.	Both. Negative due to introduced changes towards consumption of turtle meat which is a delicacy for some communities. Positive as there is an opportunity to involve the communities in awareness activities and conservation of the species.	High
India	Sand miners	Low or no interest. Heavy sand mining in various parts of species habitat areas.	Activities negatively impact the habitat of the species	Negatively impacting species habitat and nesting grounds.	High
India	Local governing bodies	Understanding and promoting the biodiversity and facilitate its conservation.	Responsible for many regulations: dam management, sand mining, fishing etc.	Both Positive as there are opportunities for the local governing bodies to promote the species and its conservation. Negative, if there are conflict of interests with	High

				regard to state policies and the conservation and management of the species.	
India	State Forest departments	Research and Conservation interest of the species and associated habitat.	Supporting project activities, permits along with logistical support.	Positive The department will positively impact the conservation of the species by undertaking management activities, and trained forest personnel will be responsible for monitoring of species population and reduce threats.	High
India	Local NGOs that work within the state	Conservation activities	Limited due to lack of funds and support for the local NGO. Supporting project activities specifically training programs in the local area.	Positive Taking over the network on completion of the project and continuing support for the species in case of by-catches	Medium
India	Veterinary surgeons and doctors	Conservation of the species	Currently limited to advise regarding turtle injuries during by-catches. More infrastructure and funds could potentially increase their role in rehabilitation and safe release of by-catches.	Positive Rehabilitation and Treatment of injured turtles in cases of by-catches	High

1.7 Context and background information that will affect the success of any conservation action for this species:

	Description	Barriers to conservation	Opportunities for conservation
Socio-cultural effects and cultural attitudes	The species has different socio-cultural effects and attitudes specific to different community beliefs. 1. Traditionally, few communities are known to consume the turtle meat but there are few known target fishing reports for the species. 2. Muslim community do not kill or consume turtle meat, however, can derive monetary benefits by selling the live individuals caught in hooks/nets. **3.** Some members of fisher communities have negative attitudes towards the species for causing damage to their fishing nets and hooks.	Killing of the species through both incidental and targeted fishing can hinder efforts for its conservation. The negative attitudes towards the species for causing damage to the fishing gear could lead to killing and selling of the turtle to recover the cost of the damaged gear.	Traditional meat consumption is rare, with most turtles caught alive and killed for opportunistic consumption after being accidentally caught. Opportunity to involve fishers for a live release program of the turtles when caught incidentally is really high. There is also opportunity to develop compensation schemes in collaboration with local governing bodies. The loss of fishers for life releases could be compensated with their work as "turtle-marshals" or "turtle-saviours". With the help of mascot, "Bheemanama" comparing the turtle to Lord Bheema, a mythological character in the Hindu epic, "Mahabharata" known for his extremely well-built and enormous strength, can help improving the perception and acceptance of the species by the local communities.

Economic implications	Most local people use the river for agricultural practises like irrigation which alter the species' habitat. Agriculture represents the main income for the majority of the wards near the river. People are also involved in sand mining activities, mostly illegally and which represents an important source of income, though for a considerably smaller number of people.	Changing agricultural practices to reduce negative impacts on the species habitats might require upfront costs that cannot be paid by farmers. It will require changes in policy and legislation at the municipal, district and in some instances, national level. These are usually long processes that require many different stakeholders to be involved and sufficient political incentives for change to occur at these levels. Economic incentives for sand mining are difficult to reduce or replace through conservation intervention.	Alternative livelihoods can be provided to communities and people to gradually reduce these activities towards more sustainable livelihoods and agricultural practices. Development of an exhaustive plan to target local stakeholders like agencies, landowners, local youth groups, organisations and individuals in the local area with an interest in natural resource management could initiate a community-led action plan. Co-management strategies can be developed in collaboration with state departments like Forest officials and local governing bodies. A system of continuous patrolling and other goals related to natural resources management and species conservation can be placed to reduce threats and illegal sand mining activities.
Existing conservation measures	The species is listed under Schedule I under the Indian Wildlife (Protection) Act, 1972 which gives the threatened species absolute protection with highest penalties in cases of offences throughout India. Trade and hunting of Schedule I species are	The protection laws for the Scheduled species are more stringent in the protected Area Network due to higher monitoring but outside of the Protected Area Network, offences like killing of by-	Section 60(A) and 60(B) of Indian Wildlife (Protection) Act may ensure rewards to be paid to persons for the assistance in detection of any offence towards the species. This can be an

	prohibited which can otherwise lead to imprisonment and/or fine.	catches and hunting of the species can go unnoticed and therefore is a barrier for the conservation of the species.	incentive to reduce target killing of the animal. The presence of a unique endangered species can help bring the focus to the study area and can also help in improving the level of protection to the habitat with a detailed management plan.
Administrative/political set-up	The administrative set-up is on two levels in India, that is, Central level and State-level. Any and all the projects proposed related to the species are given written permits by the Principal Chief Conservator of Forests and Chief Wildlife Warden (PCCF & CWW) of the state(s) where the project activities will be conducted. Any project including collection of samples or handling of Scheduled species require written permits firstly from the Central authority that is, Ministry of Environment, Forests and Climate change and then from PCCF & CWW of the state(s). Although the permits are provided by the PCCF & CWW, different divisions of the state (Northern, eastern, southern) are headed by Chief Conservators of Forests who have the duties to oversee the functioning of different environmental related projects in their divisions.	Different levels of administrative and political set-up can and usually entail extremely long periods of time for obtaining permits as well as in the decision-making processes. The functioning of the same administrative set-up can vary greatly in different states and, therefore, management activities can be difficult to carry out at the same scale in different states.	Active involvement of the higher forest officials in education and awareness programs can increase attention to the species in the state and also at national organisational levels. Building rapport and constant communication with the Principal Chief Conservator of Forests & Chief Wildlife Warden along with Chief Conservator of Forests could help in executing conservation action plan for the species in the state.

	Within each district of the divisions, the projects are also monitored by Divisional Forest officers (DFO)/Assistant Conservator of Forests (ACF) who are required to grant permits for all the activities conducted as part of the project including education and awareness programs. Range officers (RO), foresters and beat forest officers monitor activities by any researcher(s) in the forested and protected areas to ensure against any unethical practises at varying authoritative levels. For unprotected areas, social forestry division (ACF and ROs) like to be informed of all the project activities. Within a district, different panchayats have panchayat head and ward members, although they do not have much power or authority for research and conservation projects but must be informed and involved in different management activities in respective panchayats and wards.		
Local expertise and interest	The scientific knowledge and expertise have improved on the species in the past two years. The species is also gaining recognition and popularity in the country which has piqued the interest of scientific community and	The proposed monitoring and management activities might or might not be successful due to complex hierarchical structure within the environment and forest department.	The interest in local communities can help achieve action on the ground to execute community efforts for the protection of the species.

	policymakers towards its conservation. Because of the rarity and uniqueness of the species and increased popularity of their district in media, members of alert network are getting interested towards conservation of the species in Kerala. Locally, the species, although rare, is known by the different communities including some knowledge on species ecology and behaviour.	The economic benefits to the communities from dams, sand mining and other activities pertaining to species' habitat are far greater than the alternative incentives which hinders the conservation of species' habitat.	Media coverage on the species can help increase participation of local communities in conservation activities.
Resources	Economic resources are mainly allocated to large charismatic animals which are on the brink of extinction. There are almost no funds available for reptile conservation and research in the country. Research grants are difficult to obtain, however, there is relatively more priority to projects focussing on conservation of habitats and critically endangered species. With COVID situations, the available resources for conservation have been drastically reduced to restore economy.	Lack of funds for research and conservation of freshwater turtles. Less or no funds allocated for researchers per diem is also a cause of the scarce human resources throughout the country.	Opportunities to gain financial support from International organisations. Scope for collaborative studies with foreign organisations as the species has wide-ranging distribution in South and South-east Asia.

2. ACTION PROGRAMME

Vision (30-50 years)	
Viable populations of Cantor's Giant Softshell turtle (*Pelochelys cantorii*) in Kerala with local co-management to ensure that the immediate and indirect threats to the species are significantly reduced and/or mitigated.	
Goal(s) (5-10 years)	
• Fill important knowledge gaps on the species' ecology and population dynamics in Kerala. • Identify critical areas for the species' persistence and achieve their protection under Indian Wildlife (Protection) Act. • Mitigate the effects of check dams and nesting sites degradation on the population of *P. cantorii*. • The species is recognised as important for aquatic system in Kerala and appreciated locally.	
Objectives	**Prioritisation** *(low, medium, high or critical)*
1. Expand the citizen led alert network state-wide to update the distribution of the species in Kerala state.	High
2. Assess the population status and extinction risk of *Pelochelys cantorii* in Kerala state.	Critical
3. Identify areas that are critical for the viability of *P. cantorii*'s local (sub)populations in Kerala state using telemetry.	Critical
4. Increase juvenile survival through nest protection and ex-situ incubation.	Critical
5. Build capacity among local fishers of Kerala to initiate a live release program for individuals that are accidentally caught.	Critical

Activities	Country / region	Priority *(low, medium, high or critical)*	Associated costs (currency)	Time scale	Responsible stakeholders	Indicators	Risks	Activity type
Objective 1: Expand the citizen led alert network state-wide to update the distribution of the species in Kerala state.								
Hire and train researchers to initiate network building in different districts of Kerala	India/Kerala	Critical	£2000	1 years	Wildlife Institute of India (WII), research team, associated NGOs, Kerala forest Department	Review reports	Field related problems and injuries, Difficulty in obtaining permits Not enough manpower and funding	Social and Ecological Research
Conduct social surveys to obtain local ecological knowledge on the species	India/Kerala	High	£3000/year	5 years	WII, research team, associated NGOs, Local communities	Completed surveys forms in each of the 14 districts of Kerala	Field related problems and injuries, Difficulty in obtaining permits Not enough manpower and funding	Social and Ecological Research
Conduct field studies to locate populations of *P. cantorii*	India/Kerala	High	£10000/year	5 years	WII, research team, associated NGOs, State	Distribution maps, peer-reviewed articles and reports	Field related problems and injuries, Difficulty in obtaining permits	Ecological Research

building on social studies results					Forest Departments, local authorities		Not enough manpower and funding	
Analyse and present the results to stakeholders and decision makers	India/Kerala	High	£2000	5 years	Decision makers, Forest department, WII, National Biodiversity Authority	Peer-reviewed articles and reports. Workshops are conducted to communicate the findings to all the stakeholders.	Lack of response from decision makers, unwillingness to provide attention to the species.	Conservation and Research
Objective 2: Assess the population status and extinction risk of Pelochelys cantorii in Kerala state.								
Develop methods for mark-recapture study	India/Kerala	High	£2000	1 years	WII, research team	Reports	Methods might not be successful for all the study systems	Ecological Research
Initiate and conduct studies over multiple years to see population estimation and trends	India/Kerala	High	£5000/year	3-4 years	WII, research team	Peer-reviewed articles and reports	Difficulty in getting permits for the study. Securing enough funds for the study. Field-related injuries or problems	Ecological Research

Analyse and present the results to stakeholders and decision makers	India	High	£2000	5 years	Decision makers, Forest departments, WII, National Biodiversity Authority	Peer-reviewed articles and reports	Lack of response from decision makers, unwillingness to provide attention to the species, unable to bring all the decision makers and stakeholders to meet.	Research
Reassess the IUCN status	Global	Critical	£500	5 years	IUCN, WII, research team	Peer-reviewed articles and reports	Inadequate results	Research and Conservation
Objective 3: Identify areas that are critical for the viability of *P. cantorii*'s local populations in Kerala state using telemetry studies.								
Developing methods to situate the telemetry device on the turtles	India/Kerala	High	£2000	1 year	Wildlife Institute of India, collaborators for the study, experts of turtle telemetry studies, Kerala Forest Department (KFD), MoEFCC.	Peer-reviewed paper on methods	Difficulty in getting permits for the study. Securing enough funds for the study.	Research
Obtaining field equipments	USA, India	High	£30000	1 year	Wildlife Institute of India (WII), Advanced	Reports	Delay in getting equipments Faulty equipments and error in field studies	Research

					Telemetry Systems			
Habitat Use and preference study	India/Kerala	High	£2000/year	3-4 years	WII, KFD, associated state forest departments, Research team	Peer-reviewed articles and reports	Field related accidents Problems related to equipments hindering data collection	Research
Understanding movement pattern	India/Kerala	High	£1000/year	3-4 years	WII, KFD, associated state forest departments, Research team	Peer-reviewed articles and reports	Field related accidents, Problems related to equipments hindering data collection	Research
Identify critical areas through telemetry for habitat, nesting and breeding areas.	India/Kerala	High	-	4 years	WII, KFD, associated state forest departments, Research team	Peer-reviewed articles and reports	Field related accidents, Problems related to equipments hindering data collection	Research
Publish and present results to relevant stakeholders and decision-makers	India	High	£1000/year	5 years	Decision makers, Forest departments, WII, National Biodiversity Authority	Workshops and reports	Lack of timely response from decision makers, less or no attention to the species, unable to bring all the relevant stakeholders to meet.	CEPA and Conservation

***Objective 4*: Increase juvenile survival through nest protection and ex-situ incubation**								
Impact of dams and check dams on nesting ground and species habitat through monitoring and surveys	India/Kerala	Critical	£1000/year	5 years	Forest departments, Local governing bodies	Management plan to protect nesting sites during nesting periods	Dried river can cause need for water storage during nesting months. Local communities and authorities' reluctance to change period for dam closing.	Management and protection of species' habitat
Set up community-based nest protection program in identified nesting grounds.	India/Kerala	Critical	£10000 per site	5 years	Forest Department, local communities, local governing bodies,	Successful protection of atleast 10 active nest sites in Kerala	Illegal collection and/or hunting of nesting females and eggs of *P. cantorii* Less manpower for protection of nests in distant locations. Field risks and injuries during night patrols.	Protection and conservation of the species
Set up ex-situ incubation and hatchery to increase the hatching rate and survival	India/Kerala	High	£15000 per site	5 years	Forest Department, WII, local governing bodies	Atleast five incubation centres and hatcheries in Kerala	Less or no funding for setting up and regular functioning of hatcheries. Inadequate manpower for long-term maintaining the hatcheries	Ex-situ conservation
Discuss findings of the project and devise Conservation	India/Kerala	Critical	£400 for each site	Ongoing in one site	Decision makers, Forest departments, WII, National	Reports and Conservation Plan details	Lack of response and interest from the decision makers, unachievable targets set by the authorities, management policies	Conservation

Action Plan with respect to threats, ecology and conservation of the species with government officials.					Biodiversity Authority		not implemented on the ground level.	
Implementing the management activities as a part CAP.	India/Kerala	Critical	£2000 for each site	10 years	Decision makers, Forest departments, WII, National Biodiversity Authority	Reports and Conservation Plan details	Not enough response from decision makers Unwillingness to provide attention to the species Lack of funds to implement the management activities Hostility from the community members towards certain management plans	Conservation
Objective 5: **Build capacity among local fishers of Kerala to initiate a live release program for individuals that are accidentally caught.**								
Prepare intensive list of stakeholders to be targeted for awareness and capacity	India/Kerala	High	£1000 for each site	Ongoing in one site	Decision makers, Forest departments, WII, National Biodiversity Authority,	List of stakeholders	Unwillingness to attend or lack of interest by the stakeholders.	Conservation, CEPA

building activities in each district of Kerala.					community members			
Preparing training and awareness material for capacity building for live release	India/Kerala	High	£2000 for each site	Ongoing in one site	WII, research and conservation team	2 workshops conducted in each site	Unwillingness to attend or lack of interest in the stakeholders	Conservation, CEPA
Conducting the workshops for the targeted stakeholders	India/Kerala	High	£1000 for each site	Ongoing in one site	WII, research and conservation team and associated NGOs and organisations	2 workshops conducted in each site	Unwillingness to attend or lack of interest in the stakeholders Lack of funds and support from state organisations	Conservation, CEPA
Evaluating the success of capacity-building activities of the workshops	India/Kerala	High	£500 for each site	Ongoing in one site	WII, research and conservation team	Reports	Unwillingness to attend or lack of interest in the stakeholders	Conservation, CEPA

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