



# Gharial Ecology Project

*Madras Crocodile Bank Trust*



## Project progress report January – December 2023

### Project Overview

The Gharial Ecology Project (GEP) is currently in its 17th field season (2024), having commenced in 2008 in response to the significant mortality event of Gharial (*Gavialis gangeticus*) during the winter of 2007-08. Our research endeavors, supported by the international zoo community, funding from the Astral Foundation CSR, and private donations, operate under the auspices of the Madras Crocodile Bank Trust (MCBT), an NGO. The GEP initiatives are facilitated through collaborations with the State Forest Departments of Uttar Pradesh, Madhya Pradesh, and Rajasthan, as well as the Ministry of Environment, Forests, and Climate Change, Government of India, who provide the necessary permits. The primary objectives of the GEP encompass three key goals:

1. To conduct a comprehensive assessment of gharials within the National Chambal Sanctuary (NCS).
2. To identify and preserve the critical riverine habitats which is essential for the species' survival.
3. To mitigate the threats and challenges that pose risks to the continued existence of the species.

Gharials, classified as Critically Endangered (=CR), possess a global population of approximately 650-700 mature adults, out of which over 550 reside within the confines of the NCS. The execution of project activities is carried out by a compact core team consisting of 3-4 Indian biologists/naturalists, with additional guidance provided by Professor Jeffrey W. Lang, our Senior Scientific Advisor.

### Project Progress

#### ***Gharial population survey:***

In early 2023, our estimation of the total gharial population in the NCS was 1702 individuals, consisting of 172 males, 617 females, 555 subadults, 257 juveniles, and 108 yearlings. The upstream vs. downstream distribution is similar to that observed in previous recent surveys. Roughly 405 gharial inhabit the upstream habitats, with a preponderance of adults and subadults (31 males; 207 females, 114 subadults), vs. smaller size classes (53) consisting of juveniles (39) and yearlings (14). In the downstream, the 1304 gharial counted consist of 141 males, 410 females, 441 subadults, and 218 juveniles and 94 yearlings.

#### ***Gharial Hatching success:***

This year, we recorded 451 gharial nests throughout ~425 kms of National Chambal Sanctuary. 385 nests hatched successfully while the remaining were lost to natural predation and temperature changes. We had counted 9554 hatchlings during our post hatch survey.

#### ***Monsoon movement:***

Through our radiotelemetry study, this year monsoon movement revealed the movement of adult gharials not only downstream to Yamuna-Chambal Confluence but also females moved upstream to Chambal-Mej confluence in Rajasthan close to Kota. We kept close monitoring on all our tagged animal's movement through our field trackers and satellite tags. We have



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calculated the movement of a tagged female from Dangbasai upstream from Dhoplur, Rajasthan to Yamuna-Chambal confluence and moved up in Yamuna, ~380-400kms and returned to Dangbasai after monsoon.

## ***Research Publication:***

We are in the process of publishing our research data in the international scientific peer reviewed journals. We have published the population genetics of Chambal gharial with collaboration of Dr. Karthikeyan Vasudevan's lab, CCMB-LaCONES. Our main findings through this research are in finding microsatellite markers that capture the genetic diversity of Chambal gharials and identify the genetic bottleneck that happened recently in the population. Our research publication in novel acoustic communication study in adult male gharial is submitted and under review. There are two more manuscripts in the pipeline for publications later this upcoming year.

## ***Catch-Tag operation:***

In October 2023, we have tagged 16 hatchlings that survived after the monsoon flood between Barecha and Shason. We were tracking all 16 until end of January and actively tracking 12 hatchlings till date. About 50% of the hatchlings are showed no movements and the remaining 50% showed an average movement of ~ 4-6 kms.



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Photos: Monitoring nesting success with remote game cameras



Photos: Nesting success survey



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Photos: Hatchling tagging – October 2023



Photos: Tracking tagged hatchlings